

**GOVERNMENT/INDUSTRY AERONAUTICAL CHARTING FORUM**  
**Instrument Procedures Group**  
**April 29-30, 1996**  
**HISTORY RECORD**

**FAA Control # 96-01-155**

**SUBJECT:** Operational Status for OROCAs and Implementation of GPS TAAs.

**BACKGROUND/DISCUSSION:** Now that Off-Route Obstruction Clearance Altitudes (OROCAS) are being published in the United States, they need to be officially anointed by the FAA as meeting the published IFR altitude requirements for purposes of FAR 91.177. There is a question whether such altitudes can legally be used at the present time by commercial carriers, because of lack of operations specifications authorization. Further, GPS Terminal Arrival Areas charting criteria need to be implemented as a complimentary device to OROCAs for non-radar operations. With the proliferation of GPS SIAPs, a dramatic increase in non-radar IFR terminal areas is occurring in the U.S. The OROCA/TAA concept will take full advantage of GPS technology by providing route and arrival operational flexibility with the full protection of charted operational altitudes at all times.

**RECOMMENDATION:** AFS-420 be tasked to coordinate with AFS-440 and AFS-200 the implementation of TAA charting criteria for GPS SIAPs, and the implementation of requirement directives to cause OROCAs to be approved instrument altitudes for commercial operations.

**COMMENTS:** This recommendation affects Handbook 8260.19C, "Flight Procedures and Airspace," air carrier directives, and relevant directive information in the Aeronautical Information Manual.

Submitted by Captain Tom Young, Chairman  
Charting and Instrument Procedures Committee  
**AIR LINE PILOTS ASSOCIATION**  
PH: (703) 689-4205  
FAX: (703) 689-4370  
April 5, 1996

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**INITIAL DISCUSSION (Meeting 96-01):** Tom Young presented the issue on behalf of ALPA. Bill Mosley, ATO-110, stated that his office has already started work on this issue and that they have sent a letter to AFS-400 requesting approval to use the OROCA for IFR obstruction clearance. Air Traffic is still studying the "radar required" for off-route RNAV issue. Tom Young questioned whether the OROCA can guarantee communications (required for MIA). This subject will be discussed at the next Satellite Procedures Implementation Team (SPIT) meeting. The GPS TAA issue is being addressed separately in item 95-01-140. **ACTION: AFS-420 and ATO-110.**

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**MEETING 96-02:** Bill Hammett, AFS-420, stated that AFS has approved using the OROCA to satisfy IFR obstacle clearance requirements with provisions that air traffic include the OROCA in the Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) program under Order 7400.2. Bill Mosley, ATO-120, stated that his office is now working with AFS-400 to resolve supplemental navigation issues (see issue 96-01-156 for additional data). Wally Roberts (ALPA) noted that there are OROCA's in uncontrolled airspace. Bill Mosley commented that airspace issues would be considered prior to air traffic implementation. **ACTION: ATO-110/120.**

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**MEETING 97-01:** Bill Mosley, ATO-120, reported that his office is still working the issue in consort with ATO-110; however, there has been no further progress on this issue pending resolution of the supplemental navigation status of GPS. **ACTION: ATO-110/120.**

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**MEETING 97-02:** At the 97-1 meeting, Bill Mosley, ATO-120, reported that there had been no further progress on this issue pending resolution of the supplemental navigation status of GPS. An ATO-120 representative was not present at the meeting; therefore, no further update was provided. **ACTION: ATO-120.**

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**MEETING 98-01:** An Air traffic, ATO-120, representative was not available for the meeting; therefore, no report was provided. Paul Best, AFS-400 (NAS NRS), did provide a briefing on new GPS use in the Gulf of Mexico. **ACTION: ATO-120.**

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**MEETING 98-02:** Bill Mosley, ATO-120, has been working this issue. Bill Hammett, AFS-420 consultant, briefed that Flight Standards had approved using the OROCA for obstruction clearance provided continuous evaluation was incorporated under the OE program (Order 7400.2). Paul Best noted that the OROCA was intended for pilot use, not controller use. Bill Mosley noted that he was working with a group to further sectorize the OROCA into 1/2° sectors. Still to be resolved are GPS sole/supplemental navigation means, airspace and communications requirements, and controller procedures. Bill Mosley will continue working the issue. **ACTION: ATO-120.**

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**MEETING 99-01:** Bill Mosley, ATO-120, briefed that there has been no progress on this issue. He is working with TG-133 to further sectorize the OROCA into 1/2° sectors. The "radar required" issue is still being staffed within ATO. Wally Roberts, ALPA, brought up the controlled airspace issue, especially in the westernmost U.S. Bill briefed that airspace issues are also being addressed. Bill Hammett, AFS-420, noted that the AFS approval to use the OROCA for obstruction clearance was dependent on incorporating the OROCA into the OE program. Informal contacts within ATA-400 organization indicate that this is not being considered in the re-write of Order 7400.2. Bill Mosley will coordinate this with ATA-400. **ACTION: ATO-120.**

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**MEETING 99-02:** Bill Hammett, AFS-420, suggested that due to inactivity on this issue, (3.5 years with no change in status) it should be dropped from the Instrument Procedures Subgroup. He further recommended that, since resolution lies within Air Traffic (ATO-100 and ATA-400), the issue be worked through ATPAC. Bill also noted that the AFS approval to use the OROCA for obstruction clearance was dependent on incorporating the OROCA into the OE program. Informal coordination indicates that this was not included in the draft re-write of Order 7400.2. Tom Meyer, ATP-402 (AMTI), stated that ATP-402 and ATA-400 are actively working the issue through the SOIT and internally through the FAA ATSOIT. ATA-400 is addressing rulemaking changes to address controlled airspace issues and ATP-100 is working radar requirements relating to OROCA use. The group recommended that a representative of Air Traffic brief the next meeting of the ACF Instrument Procedures Subgroup on the status of the issue thus far. Tom agreed to take the message to the ATSOIT. **ACTION: ATP-402.**

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**MEETING 00-01:** Tom Meyer, ATP-402 (AMTI), briefed the issue. The ATSOIT is investigating using the OROCA; however, the ATSOIT is concentrating on the development of an RNAV MOCA-like altitude as the primary altitude for direct/RNAV clearances. It is believed that an altitude based on a one-degree square is often too high to be of value. Other initiatives being investigated include; a) developing a MOCA/R concept for RNAV routes not dependent on NAVAID's; b) consideration of incorporating the OROCA into Order 7400.2 for evaluation and use for waypoint-to-waypoint routes; c) using RNAV to fly preferred routes and associated MEA's in place today; and, d) consideration of incorporating RNAV routes into Part 95. Randy Kenagy, AOPA, requested the OROCA remain a prime consideration as an IFR altitude for RNAV (especially GPS) off route clearances. Tom indicated it would remain on the table as a consideration. **ACTION: ATP-402.**

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**MEETING 00-02:** An Air Traffic (ATP-402) representative was not available to discuss the issue; therefore, the issue is continued to the next meeting. **Editor's Note:** ATP-402 provided the following status update on the issue after the meeting for inclusion in the minutes: *The use of the OROCA was discussed during the preliminary discussions leading to the development of a Notice of Proposed Rulemaking (NPRM) updating 14 CFR for area navigation. This discussion included the development of an MOCA for RNAV routes, independent of the NAVAID. The draft NPRM is under development by a contractor working for AFS-400. The first draft is scheduled for completion on December 15, 2000. Advanced Navigation Routes (ANR) eliminating the requirement to over fly source referenced (ground-based) navigation aids are currently under development by the ATSOIT. Initial publication of ANR's will occur in the Airport/Facilities Digest (AFD). The ACF RNAV Transition Working Group has taken this issue as an action item "RNAV-00-01-06; RNAV Routes and MEA on En Route Charts".* **ACTION: ATP-402.**

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**MEETING 01-01:** Gary Powell, ATP-104, briefed that there has been little progress on this issue. A contractor is working the rulemaking progress. There was a general discussion over the OROCA, its original intent, and applicability for off-route, non-radar, RNAV IFR flight. Gary requested a copy of the original issue paper and Bill agreed to provide it. **ACTION: ATP-104.**

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**MEETING 01-02:** Gary Powell, ATP-104, briefed that he has been reviewing the past history of this issue and noted that there have been so many discussions and changes to the original issue that he is unsure what the solution is now. Bill Hammett, AFS-420 (ISI), recapped the history. He also noted that ATA-400 did not include an OROCA evaluation in the OE/AAA process during the re-write of Order 7400.2. This was a key element of the AFS-400 approval for use of the OROCA for obstruction clearance; therefore, the issue should be closed from further consideration. Brad Rush, AVN-160, stated that using the OROCA as an approved, routinely assigned altitude for off-route RNAV IFR flight is changing the original intent of OROCA. Norm LeFevre, AFS-420, concurred, adding that there is no assurance of reception, controlled airspace, periodic review, communications, etc. Brad Alberts, FPA, noted that FAA needs a plan for the future. Free flight at lower altitudes will demand a non-radar altitude and the OROCA seems appropriate for this. Gary Powell, ATP-104, stated that his office is addressing the “non-radar” issue for off route RNAV flight through various forums. He will ensure the OROCA issue is on the agenda for discussion at the Dec 2-3 ATSOIT. The group recommended that ALPA take the lead in concert with FPA, AOPA, and NBAA in developing a restatement of the intent of the original issue paper.

**ACTION:** ATP-104.

**Editorial Note:** ALPA provided the following post-meeting restatement of the issue, which is included in the minutes:

*The OROCA issue needs to remain open before the ACF. The present OROCA concept is flawed, for several reasons including its excessive size rendering it useless in mountainous areas and because there is no minimum entry altitude assessment (a.k.a.: “area MCA”).*

*The off-route concept needs to be explored and refined. There are both ATC and obstacle clearance aspects that must be refined to be safe and operational. Perhaps the ATC aspects need to be brought before ATPAC, and perhaps the obstacle-operational issues can be addressed in other working groups. Regardless, oversight of the ultimate resolution of the obstacle and operational issues of direct, off-route flight remains a matter for the ACF.*

*Today, both pilots and controllers initiate off-route “direct-to” clearances. The reality is that such direct-to clearances are often issued at altitudes well below the minimum IFR altitude for higher terrain that may be at considerable distance at the time of the initial issuance of a direct-to clearance. The pilot must possess a simple, positive tool to determine the minimum safe off-route altitude in the event a direct-to clearance progresses into an area of higher terrain, and ATC intervention is unavailable on a timely basis.*

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**MEETING 02-01:** Gary Powell, ATP-104, briefed that he has researched this issue from its origin and to say it is confusing is an understatement. Gary stated that FAA policy is that controllers do not use the OROCA for off route altitude assignments, rather they use a minimum IFR Altitude (MIA), developed under Orders 7210.3 and 7210.37. OROCA and MIA are similar for obstruction clearance criteria; however, the MIA lateral dimensions are flexible to allow optimum air traffic use of available altitudes, whereas the OROCA areas are based on 1 degree square grids. Marty Walker, ATP-120, disagreed stating that controllers regularly do assign OROCA's. Wally Roberts, ALPA, stated that adding TAAs to all RNAV

charts would satisfy ALPA's initial concern. After a lengthy discussion over obstacle data bases, OROCA and MIA development, etc., Bill Hammett, AFS-420 (ISI), stated that if the OROCA was an acceptable Part 91.177 altitude, then it should be authorized for controller use in Order 7110.65 and pilot educational material should be published in the AIM. Bill added that several issues which impact other offices must be addressed, to wit: 1) OROCA evaluation must be included under the OE/AAA program in Order 7400.2 – OPR is ATA-400; 2) A NOTAM policy must be developed to promulgate off-cycle changes – OPR is ATP-300; 3) Controller procedures must be developed and AIM material published – OPR is ATP-120; and, 4) OROCA use should be coordinated through General Council to determine if the OROCA satisfies Part 91.177 and whether it should be placed under Part 95 and to ensure it will satisfy part 91.177 requirements – OPR is AFS-420. No one agreed to spearhead the effort, nor was there consensus for closure. Norm LeFevre will coordinate the AGC issue and Marty Walker was tasked to determine controller need/use. **ACTION: ATP-120 and AFS-420.**

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**MEETING 02-02:** Bill Hammett, AFS-420, researched all past available files regarding the OROCA and briefed a history of the issue since its inception for the group (see italic text below). Bill also briefed that on September 13, the Chair of the Instrument Procedures Group forwarded a letter to FAA/AGC-200 requesting a legal position on OROCA use. If recommended for use by AGC, Bill recommended that a group with representation from the lines of business involved in this issue must address a solution. He suggested possibly the ATSOIT or SPIT. Gary Powell, ATP-104, stated that the ATSOIT would be disbanded with the formation of a new RNP Program Office, ATP-500, and that the SPIT only addresses approach and departure procedures. This new ATP-500 office would have AIR, AAT, and AFS staffing expertise. Bill also noted that the issue could not be pursued unless ATA-400 included the OROCA in the obstacle evaluation (OE) process under Order 7400.2 (this was recommended, but not done at the last re-write of the order). Hal Becker, AOPA, stated that RTCA SC-192 has recently also recommended to ATA-400 that OROCA be included under the OE process. The consensus is that no action can be pursued until a response is received from AGC-200. AFS-420 will track an AGC-200 response and take appropriate action when received. **ACTION: AFS-420.**

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## **OROCA HISTORY**

*On April 19, 1991, the DoD submitted an Interagency Air Cartographic Committee (IACC) requirements document (RD #442) to publish a military minimum instrument altitude (MMIA) on US low altitude enroute IFR charts.*

*The FAA (AFS and AAT) non-concurred with RD 442 for several reasons:*

- 1. MMIA could be confused with MIA*
- 2. IFR low charts are intended for use in instrument flight rules flight and altitudes are established by air traffic control.*
- 3. The GPS system is not certified for IFR flight (now a moot point).*
- 4. Random RNAV routes may only be approved in a radar environment.*

*On January 10, 1993 FAA, NOAA, and DoD met to discuss the non-concurrence. DoD is pushing for MMIA publication as the Army is scheduled to receive aircraft in its inventory that will only be GPS /INS equipped. The USAF is supporting publication as an emergency IFR lost communications altitude. The minutes reflect significant FAA concern over the differences in size of the proposed MMIA area and the MIA areas used by ARTCC controllers. MIAs are in many smaller, irregular sectors and only provide obstruction clearance; they do not reflect radar coverage. There was no resolution at this meeting.*

*On April 14, 1993, a working group meeting was held to discuss and resolve the issue. Participants at this meeting included representatives of FAA ATP-100/200, AFS-420/800, AGC-230; NOS and DoD charting organizations; as well as several industry pilot and charting groups. Several conclusions were agreed:*

- 1. The term "MMIA" would be changed to "OROCA" to eliminate confusion with MIA.*
- 2. OROCAs may be artificially high due to the large 1 degree x 1degree area.*
- 3. The group agreed that some type of RNAV altitude will be needed in the future, whether or not the OROCA is a viable option was not decided.*
- 4. FAA/AGC-230 voiced concern regarding legality and liability issues, stating at one point "the more we differentiate from MOCA, MIA, etc., the better. We want to make clear this is not an instrument altitude. We should minimize risks by examining alternatives."*
- 5. The group agreed to publish the OROCA on the IFR Enroute Low Charts.*
- 6. The group agreed that the reason for providing this altitude was for obstruction clearance only and the chart should be annotated clearly with this proviso.*

*On March 9, 1994, based on the results of the April 1993 meeting, DoD again re-submitted RD #442 for consideration. The RD was approved on July 12 1994.*

*However, the RD did not include IACC specifications on how the OROCA was to be determined and does not clearly specify the proviso to add the annotation agreed to at the April 1993 meeting. IACC Specifications for the OROCA were drafted; similar to those contained in IACC-2 for the maximum elevation figure (MEF) published on Sectional Charts. The draft OROCA IACC specifications for OROCA determination and charting were originally used in-house by NOAA and are now currently used by AVN-500 (NACO). The specifications include that the following explanatory note, which was agreed to at the April 1993 meeting, to be charted:*

*“This chart contains off route obstruction clearance altitudes (OROCA). The off-route obstruction clearance altitudes shown in quadrangles bounded by ticked lines of latitude and longitude are represented in THOUSANDS and HUNDREDS of feet above mean sea level. The OROCA is based on information available concerning the highest known features in each quadrangle, including terrain and obstructions. OROCA provides obstruction clearance with a 1000-foot buffer in designated non-mountainous areas and a 2000-foot buffer in designated mountainous areas within the United States. This altitude is provided for obstruction clearance only, it does not provide for NAVAID signal coverage, communication coverage, and it would not be consistent with altitudes assigned by air traffic control.*

*Example.....12<sup>5</sup>*

*This note was originally published on the charts and was still in the draft specifications as of June 2002; however, it has been removed from the charts by AVN-500. Formal specifications for OROCA determination have yet to be published in IACC-1.*

*On March 20, 1996, ATP-20 wrote AFS-420 requesting approval to use the OROCA as an IFR altitude. After review, AFS-400 responded on July 26<sup>th</sup> that Flight Standards concurred that the OROCA, rounded to the next higher cardinal altitude could be used to satisfy obstruction clearance requirements for off-route minimum IFR altitudes. However, this approval was contingent on Air Traffic ensuring that the OROCA is included for evaluation in the Obstacle Evaluation process under Order 7400.2 and initiate NOTAM policy to promulgate changes when necessary during charting cycles.*

*On May 22, 1996, ATA-100 sent a memo to AGC-230 requesting to revise the published OROCA note on the chart by changing the last sentence to read: “Flight plan filing of an altitude equal to or greater than the OROCA complies with Federal Aviation Regulations (FARs) for the minimum altitude necessary for off airway IFR flight, but may not guarantee NAVAID signal or communications coverage.” The memo was returned annotated “We cannot concur with this change. The highlighted text (in quotes above) presents certain legal problems. We will be happy to work with you in developing other options.” Signed Patrica R. Lane and Timothy P. Melcher, AGC-230*

*On June 27, 1996, AOPA supported Air Traffic’s request to use the OROCA for off-route GPS routings. AFS-400 responded that this issue was being worked by the Satellite Procedures Implementation Team (SPIT).*

*OROCA use has been an Aeronautical Charting Forum (ACF) agenda issue since April 30, 1996. Despite many discussions, no progress has been made in resolving the issue.*

*On September 13, 2002, the chairperson of the ACF, Instrument Procedures Group wrote a memorandum to AGC-200 for further interpretation of the feasibility of using the OROCA as an IFR altitude for off-route navigation.*



**MEETING 03-01:** Bill Hammett, AFS-420 (ISI), briefed that Tom Schneider, as Chair of the ACF-IPG, wrote AGC-230 for a legal opinion on OROCA use for off-route RNAV flight. AGC-230 met with ATP-110, ATP-104, and ATA-400 and received feedback that Air Traffic expressed no interest in OROCA use. A subsequent meeting with the ACF-IPG Chair, ATP-110, and AGC-230 substantiated this fact. AGC-230 stated that a legal opinion would not be issued unless there is an agency need/support for OROCA use. Regrettably, there was no ATP-100 representation for the ACF discussion; however, ATP-110 is verbally on record that Air Traffic has no use for the OROCA. Off-route RNAV operations must be in a radar environment; therefore, Air Traffic prefers use of MVA and MIA charts instead. Bill briefed that the OROCA was originally developed as a Military Minimum IFR Altitude (MMIA) primarily to provide a safe altitude to assist lost-communications aircraft. Bill also recommended that the full OROCA definition be published on the charts as agreed at the 1993 FAA/DMA/NOS meeting and included in the draft chart specs. The correct definition should also be included in the AIM and Pilot/Controller Glossary. Unless Air traffic is interested in supporting the issue, no further action will be pursued. Bill recommended the issue be closed. There was no objection from the group provided correct information is provided to pilots and controllers. Bill agreed to prepare a requirements letter for IACC consideration. Valerie Watson will forward the correct OROCA definition to ATP-120 for inclusion in the Pilot/Controller Glossary. **Issue Closed.**

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